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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,455	07/27/2001	Shoichi Yamazaki	2369.0110	7010

5514 7590 11/04/2002

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NEW YORK, NY 10112

EXAMINER

SEYRAFI, SAEED HMT

ART UNIT	PAPER NUMBER
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2873

DATE MAILED: 11/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,455

Applicant(s)

YAMAZAKI, SHOICHI

Examiner

Saeed H Seyrafi

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-28 is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6 and 29 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Request Continued Examination

1. The request filed on xx for a Request Continued Examination (RCE) under 37 CFR §1.116 based on parent Application No. 09/915455 is acceptable and a RCE has been established. An action on the RCE follows.

Information Disclosure Statement

2. Acknowledgment is made of receipt of Applicant's Information Disclosure Statement (PTO-1449) filled on 9/4/2002.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1- 5 are rejected under 35 U.S.C. 102(a) as being anticipated by Shi (EP1043619 A2).

Regarding claim 1, Shi discloses a reflective display means 9(fig. 6, ref. # 2), illumination light source means for illuminating the display means (fig. 6, ref. # 14-15, 41); an illumination optical system for guiding light from the illumination light source means to the display means (fig. 6,ref. # L3), and a display optical system for guiding light from the display means to an eye of an observer (fig. 6, ref. # L2), wherein the

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illumination optical system and the display optical system share only one surface of optical surface A having two functions of transmission and reflection with each other (fig. 6, ref. # L3 and upper side of L2), wherein a reference ray emitted from the illumination light source means and passing a center of an image on the display means and a center of the eye is incident from the illumination light source means to the optical surface A (fig. 6, ref. # 41, L3, 2 and I2), is reflected under a condition of an angle $\alpha(o)$ of $20 < \alpha < 80$ between the entering reference ray and the reflected reference ray on the optical surface A (fig. 8, ref. # L1a & reflected beam), is incident substantially normally to the display means (fig. 8, ref. # 2), is reflected thereby (fig. 8, ref. # 2), is transmitted through the optical surface A (fig. 8, ref. # L1a), is reflected by a plurality of decentered, reflective curvature surfaces, and thereafter is guided to the eye (fig. 8, ref. # L2), and wherein the display optical system is comprised of an optical member comprising the optical surface A (fig. 8, ref. # L1a) and another optical member having an optical refracting power, said optical members being placed with an air space in between (fig. 8, ref. # L2).

Regarding claim 2, Shi discloses the optical surface A in the illumination optical system is a reflective curvature surface having a positive refracting power on a local meridional section (a plane including incident light and exit light of the reference ray) (fig. 6, ref. # 31).

Regarding claim 3, Shi discloses the illumination light source means is an RGB time division light source and the display means displays images of R, G, and B in time

division in synchronism with emission of color light beams of R, G, and B from the RGB time division light source (paragraph 0059).

Regarding claim 4, Shi discloses an angle $\beta(o)$ of incidence to the reflective display means, of the reference ray emitted from the illumination light source means satisfies the following condition: $-10 < \beta < 10$ (fig. 8, ref. # 2).

Regarding claim 5, Shi discloses the display optical system includes two or more surfaces with refracting powers differing depending upon azimuth angles, and the entire display optical system has a positive refracting power (fig. 8, ref. # L2).

Allowable Subject Matter

5. Claims 7-28 are allowed.

6. The following is an examiner's statement of reasons for allowance:

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitation of the dependent claims, in such manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims, which include an optical surface A having two functions of transmission and reflection, shared between an illumination optical system and a display optical system, has a curvature on a local meridional section, where $local_f_y$ represents a focal length in the local meridional section of the display optical system and $local_f_{yA}$ a focal length in the local meridional section of only the optical surface A in the illumination optical system, a ratio of the focal lengths satisfies

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the following condition: $0.1 < \text{local_fyA} / \text{local_fy} < 1.0$ (claim 7), when local_ryA represents a radius of curvature in a local meridional section, at a point of intersection with the reference ray on a optical surface A of a lens body in a display optical system and local_ryB a radius of curvature in the local meridional section, at a point of intersection with the reference ray on a curved surface B, local_ryA and local_ryB have an identical sign and satisfy the following condition:

$0.4 < \text{local_ryA}/\text{local_ryB} < 2.0$ (claim 13), an illumination optical system and a display optical system share an optical curvature surface A having two functions of transmission and reflection with each other, a curved surface B is provided on the opposite side of the optical curvature surface A to a display means, and the optical curvature surface A and the curved surface B compose a lens body, when an F3 eye center ray represents a ray passing the center of the eye and an outermost image height F3 on the far side from the eye and when an F2 eye center ray represents a ray passing the center of the eye and an outermost image height F2 on the near side to the eye, an optical path length of the F3 eye center ray in the lens body in the display optical system is longer than that of the F2 eye center ray (claim 21).

7. Claims 6 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

An F3 eye center ray represents a ray passing the center of the eye and an outermost image on the far side from the eye, local-fy(F3) is a total focal length in the local meridional section of the display optical system on the F3 eye center ray, local-fyC(F3) is a focal length in the local meridional section on a hit point of the F3 eye center ray on a transmissive surface C with a refracting power closest to the eye, and a ratio of the focal lengths satisfies the following condition:

$$-0.6 < \text{local_fy(F3)}/\text{local_fyC(F3)} < -0.1 \text{ claim 5).}$$

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takeyama (6462881) is cited for disclosing an image display apparatus, Togino (6396639) is cited for disclosing a viewing optical system and image display apparatus using the same.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed H Seyrafi whose telephone number is (703) 306-5584. The examiner can normally be reached on Mon., Tue., Thu., and Fri. 7 am-5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y Epps can be reached on (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

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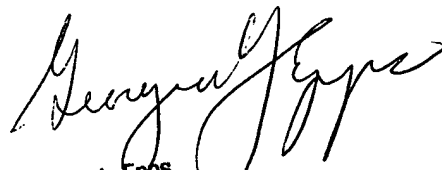
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308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



S. Seyrafi
October 26, 2002



Georgia Epps
Supervisory Patent Examiner
Technology Center 2800